[redacted]

From: Lo, Jonathan (FIR)
Sent: Tuesday, January 24, 2023 2:10 PM
To: Harold, Kathy (FIR)
Subject: RE: 241 Loomis St - Hydrogen/Electricity Facility

Thank you, Chief Harold!

Jonathan Lo, P.E.
Fire Protection Engineer
San Francisco Fire Department
Desk: 628-652-3269
Email: jonathan.lo@sfgov.org

From: Harold, Kathy (FIR) <kathy.harold@sfgov.org>
Sent: Tuesday, January 24, 2023 1:57 PM
To: Lo, Jonathan (FIR) <jonathan.lo@sfgov.org>
Subject: Fw: 241 Loomis St - Hydrogen/Electricity Facility

Hi Jonathon,

Below are some email exchanges. Other things to consider are:

Location of trailer and location of new trailer coming in. Is the lot being painted to mark these areas?
Impact protection around hydrogen and generator?
How is the fuel in the trailer being connected and disconnected.
How close is the electrical to the hydrogen and hydrogen dispensing
Is the Electrical have a higher rating? To what distance?
How are the generator and hydrogen trailer being seismically secured?
Are you planning to use electrical cords as permanent wiring?
Route through City? Time of Day?

I'm sure there is a lot more. Thank you,

Kathy Harold
Assistant Fire Marshal

Permit Center
San Francisco Fire Department
628 652-3262

From: Teague, Corey (CPC) <corey.teague@sfgov.org>
Sent: Wednesday, June 29, 2022 11:59 AM
To: Piakis, Jonathan (DPH) <Jonathan.Piakis@sfdph.org>; Harold, Kathy (FIR) <kathy.harold@sfgov.org>; Fessler, Thomas (DBI) <thomas.fessler@sfgov.org>
Cc: Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>; Leon, Andrea (DPH) <andrea.leon@sfdph.org>
Subject: RE: 241 Loomis St - Hydrogen/Electricity Facility

Thank you all for the very quick and thorough responses. I'll respond to the applicant.

Corey A. Teague, AICP, LEED AP
Zoning Administrator
(he/him/his)

Current Planning Division
San Francisco Planning
49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103
Direct: 628-652-7328 | sfplanning.org
San Francisco Property Information Map

From: Piakis, Jonathan (DPH) <Jonathan.Piakis@sfdph.org>
Sent: Wednesday, June 29, 2022 11:41 AM
To: Harold, Kathy (FIR) <kathy.harold@sfgov.org>; Fessler, Thomas (DBI) <thomas.fessler@sfgov.org>; Teague, Corey (CPC) <corey.teague@sfgov.org>
Cc: Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>; Leon, Andrea (DPH) <andrea.leon@sfdph.org>
Subject: RE: 241 Loomis St - Hydrogen/Electricity Facility

Hi all,

This would also trigger review from the DPH Hazardous Materials and Waste Program. The project should be routed to us via the standard processes in place and we will follow up directly with the project sponsors regarding requirements for inspection and registration (or modification of documentation if already registered). You can list Andrea Leon (copied here) and myself down as contacts for DPH Hazmat should the sponsors have any questions prior. Thanks.

Jonathan Piakis, MPH, CIH
Senior Industrial Hygienist
San Francisco Department of Public Health | Environmental Health Branch
Hazardous Materials and Waste, Emergency Response, and Asbestos Programs
49 South Van Ness Avenue, Suite 600
San Francisco, CA 94103
415-252-3911 Office
jonathan.piakis@sfdph.org
www.sfdph.org/dph/eh

From: Harold, Kathy (FIR) <kathy.harold@sfgov.org>
Sent: Wednesday, June 29, 2022 10:27 AM
To: Fessler, Thomas (DBI) <thomas.fessler@sfgov.org>; Teague, Corey (CPC) <corey.teague@sfgov.org>; Piakis, Jonathan (DPH) <Jonathan.Piakis@sfdph.org>
Cc: Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>
Subject: Re: 241 Loomis St - Hydrogen/Electricity Facility

Hi Corey,

You definitely want to have a pre-application meeting with the Fire Department before you move forward with this proposal. The Fire Department regulates hydrogen and hydrogen fueling. The Fire Code has a difficult time keeping up with current technologies and for hazards not addressed in the Code, the Code leaves it up to the Authority having Jurisdiction on how they will regulate the activity.

Items we will want to know about:

How much fuel is being transported through the City and what route is being used, time of day and number of times per week?
What is being used to transport the fuel?
Does DOT regulate the transporting of this fuel? If yes, how?
What safety guidelines are in place for 1. Leaks, Fires, vehicle protection, explosion's?
How is fuel being transfered?
What is the location look like and what does the surrounding area look like.
Who will be doing the fueling?
Will the site operate 24 hours a day?

Are main concern is this fuel being transported through the City and the gas catching fire and exploding taking out a block of people and structures.

Kathy Harold
Assistant Fire Marshal
Permit Center
San Francisco Fire Department
628 652-3262

From: Fessler, Thomas (DBI) <thomas.fessler@sfgov.org>
Sent: Wednesday, June 29, 2022 9:20 AM
To: Teague, Corey (CPC) <corey.teague@sfgov.org>; Piakis, Jonathan (DPH) <Jonathan.Piakis@sfdph.org>
Cc: Harold, Kathy (FIR) <kathy.harold@sfgov.org>; Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>
Subject: RE: 241 Loomis St - Hydrogen/Electricity Facility

Hi Corey,

This is an odd one. I understand a building permit would be required to document the change of use for the Planning Department. The Building Department would view this as a F-1 occupancy electric generation plant. The applicant may want to have a pre application meeting with building and fire departments. I am copying both fire and mechanical plan checkers regarding this.

Thanks Tom

Thomas Fessler
Department of Building Inspection
Senior Building Inspector
49 South Van Ness Ave, 5th floor
San Francisco, CA 94103
(628) 652-3721
Email: Thomas.fessler@sfgov.org

From: Teague, Corey (CPC) <corey.teague@sfgov.org>
Sent: Tuesday, June 28, 2022 9:08 PM
To: Piakis, Jonathan (DPH) <Jonathan.Piakis@sfdph.org>; Fessler, Thomas (DBI) <thomas.fessler@sfgov.org>
Subject: 241 Loomis St - Hydrogen/Electricity Facility

Jonathan and Thomas,
I received a request from a company that is working with Cruise Automation to install a trailer & a gas module using hydrogen to generate electricity to fuel cell generators onsite, which will charge high voltage DC Chargers, which will then charge a fleet of Electric Autonomous Vehicles. I don't have any more info than that, but here is the website of the manufacturer, specifically the trailer specs: https://www.oneh2.com/hardware.html

This activity will represent a change of use of the existing vacant property, and will definitely require a permit and Planning Department review. However, I'm not sure if this type of project would trigger any special review by DBI, Fire, or DPH. Can you please either 1) provide me any information that would be helpful to pass along, and/or 2) provide contacts in your departments for me to refer this company to?

Thanks in advance.

Corey A. Teague, AICP, LEED AP
Zoning Administrator
(he/him/his)

Current Planning Division
San Francisco Planning
49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103
Direct: 628-652-7328 | sfplanning.org
San Francisco Property Information Map

[redacted]

From: Pollot, Kristin <Kristin.Pollot@stantec.com>
Sent: Wednesday, February 8, 2023 4:35 PM
To: Kwok, Stephen (DBI); Shaikh, Mohsin (DBI); Fire.Preapp, (FIR); DBI Pre-Application Requests; 'Julie Barnard'; Lo, Jonathan (FIR)
Cc: 'Darren Hau'
Subject: Pre-App meeting for 241 Loomis St. - MEETING NOTES
Attachments: DBI Meeting Notes_1.24.23.docx

Importance: High

All,

The Cruise team wanted to thank you again for taking the time to review and discuss the temporary hydrogen trailer project with us. To follow up from our meeting on 1/24, I wanted to share our draft meeting notes for everyone to review. We are planning to provide these notes to the SF Planning Department to help confirm their stance on permitting (from a zoning perspective) so it will be important to make sure this information is accurately presented.

If you could all please take a look at the attached and let me know if you have any clarifications, I would greatly appreciate it!

Thank you again,

Kristin Pollot AICP
Principal Urban & Environmental Planner
Mobile: (341) 215-6797

From: Kwok, Stephen (DBI) <stephen.kwok@sfgov.org>
Sent: Wednesday, January 25, 2023 1:26 PM
To: Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>; Fire.Preapp, (FIR) <Fire.Preapp@sfgov.org>; Pollot, Kristin <Kristin.Pollot@stantec.com>; DBI Pre-Application Requests <dbi.preapprequests@sfgov.org>; 'Julie Barnard' <julie.barnard@getcruise.com>; Lo, Jonathan (FIR) <jonathan.lo@sfgov.org>
Subject: Re: FW: Pre-App meeting for 241 Loomis St.

Hi,

Regarding our pre-application meeting and the determination of the mobile trailers, I discussed this further with other senior staff and have an update regarding DBI's consideration.

Where unoccupied mobile utility trailers are placed on the site and remain on wheels, the mobile trailers would not be considered structures. These appurtenances would still be required to comply with all applicable code requirements including Fire and Mechanical codes. This project would require a permit to identify the location and function of these components to determine code compliance.

Thank you.

Stephen Kwok

Senior Building Inspector

Plan Review Services - Department of Building Inspection

City and County of San Francisco

49 S. Van Ness Ave.| 5th Floor

San Francisco | CA 94103

Stephen.kwok@sfgov.org

Phone: (628) 652-3756

www.sf.gov/dbi

From: Pham, AnhHai (DBI)
Sent: Friday, January 13, 2023 11:25 AM
To: Pham, AnhHai (DBI) <anhhai.pham@sfgov.org>; Kwok, Stephen (DBI) <stephen.kwok@sfgov.org>; Tam, Richard (DBI) <richard.w.tam@sfgov.org>; Shaikh, Mohsin (DBI) <mohsin.shaikh@sfgov.org>; Fire.Preapp, (FIR) <Fire.Preapp@sfgov.org>; Harold, Kathy (FIR) <kathy.harold@sfgov.org>; Mann, Kerry (FIR) <kerry.mann@sfgov.org>; Gilbraith, Kathleen (FIR) <kathleen.gilbraith@sfgov.org>; Pollot, Kristin <Kristin.Pollot@stantec.com>; 'Julie Barnard' <julie.barnard@getcruise.com>
Subject: FW: Pre-App meeting for 241 Loomis St.
When: Tuesday, January 24, 2023 2:00 PM-3:30 PM.
Where: conference call

Hi Stephen,

The below pre-app meeting with (BLDG & SFFD) was scheduled with Richard Tam on 1/24/2023 at 2pm. However, Richard is busy on that day due inter department meeting. Please let me know if you can cover for Richard?

Thank you and have a great long weekend!

Best regards,

Anh Hai Pham

-----Original Appointment-----
From: Pham, AnhHai (DBI)

Sent: Friday, January 6, 2023 3:09 PM
To: Tam, Richard (DBI); Shaikh, Mohsin (DBI); Fire.Preapp, (FIR); Harold, Kathy (FIR); Mann, Kerry (FIR); Gilbraith, Kathleen (FIR); Pollot, Kristin; 'Julie Barnard'
Subject: Pre-App meeting for 241 Loomis St.
When: Tuesday, January 24, 2023 2:00 PM-3:30 PM (UTC-08:00) Pacific Time (US & Canada).
Where: conference call

Hi everyone,

We invite your team to join the DBI Pre-Application meeting via conference call on **1/24/2023 at 2pm**

Attached is the pre-screened materials for the Pre-Application meeting to use. For all the participants to join the meeting, please dial into **USA toll free #-(877)336-1828** and use the **Participant code: 710810** to join the meeting. DBI plan examiner who hosts the meeting will receive a Host code in separate email. If you have any questions, please let me know

Thank you,

Anh Hai Pham
Department of Building Inspection
City & County of San Francisco

cruise

December 20, 2022

Plan Review Supervisor for Pre-Application Meeting
Department of Building Inspection
49 South Van Ness Ave., Suite 590
San Francisco, CA 94103

Reference:
Proposal for Cruise SF Temporary Hydrogen Trailer at 241 Loomis Street

Cruise SF would like to request a pre-application meeting with the San Francisco Department of Building Inspection to confirm the permitting requirements for a temporary hydrogen refueling station to support the vehicle charging needs for Cruise's local all electric, autonomous vehicle fleet. The meeting materials packet attached includes our main questions for the pre-application meeting, as well as additional documentation regarding the proposed project background/needs, operational details, and an overview of life safety controls and environmental notes.

We look forward to meeting with Building Inspection staff to review and discuss any permitting requirements for the proposed project.

Sincerely,

Julie Barnard
Entitlements Project Delivery Manager

CRUISE SF HYDROGEN TRAILER

City and County of San Francisco,
Department of Building Inspection
Pre-Application Meeting Materials

Prepared for:
Julie Barnard,
Entitlements Project Delivery Manager
Cruise

Prepared by:
Kristin Pollot
Principal Planner
Stantec

December 20, 2022

Sign-off Sheet

This document entitled CRUISE SF HYDROGEN TRAILER was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Cruise (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Kristin Pollot

Prepared by _____

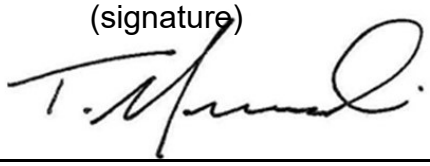
(signature)

Christine Abraham

Reviewed by _____

(signature)

Trevor Macenski



Approved by _____

(signature)

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1.0 Pre-Application Meeting Questions

Project Name: Cruise SF Hydrogen Trailer

Project Location: 241 Loomis Street, San Francisco, CA 94124

Brief Project Summary: Proposal includes the long-term usage (two to eight years) of a hydrogen trailer (on wheels) to provide an interim power source for charging the Cruise electric vehicle fleet to be stored onsite. The hydrogen trailer power source would be fueled by hydrogen gas that would be brought to the site every 1-2 days, via a refueling trailer provided by a third-party vendor (OneH2). Additional project details are included below.

Meeting Questions:

1. **Does the project require any building permits?**

   Statement of Position: Our assumption is that no new building permits would be required, as the project only involves temporary components (vehicular trailers and equipment not attached or affixed to the ground or any other permanent structures).

2. **Are there any specific City, State or Federal regulations the project would need to adhere to for the hydrogen fuel storage/handling?**

   Statement of Position: The Cruise research team has found no special City regulations that apply to hydrogen fuel storage/handling. The team proposes to adhere to NFPA (National Fire Prevention Association) codes/standards, in conjunction with best management practices recommended by a hydrogen industry consortium.

3. **Can hydrogen fuel cell wastewater be discharged into the existing storm drain? And if so, would a minor encroachment permit be needed from the Department of Public Works for drainage across the sidewalk?**

   Statement of Position: As discussed below, the wastewater produced from the hydrogen fuel cells could total up to 120 gallons of water per day (or up to five gallons per hour), which would need to be removed from the site on a very regular basis. According to the hydrogen trailer manufacturer, the wastewater has no contaminants or priority pollutants, and as such, would be clean enough to drain into the City's existing storm drain system using a waiver under the City's existing MS4 (Municipal Separate Storm Sewer Systems) permit. Third party testing of the water is underway to confirm its contents, but assuming all is in alignment and the water is clean, Cruise would like to drain directly to an existing storm drain inlet.

2.0 Supporting Project Information & Materials

2.1 Executive Summary

Cruise is an all-electric autonomous vehicle fleet that aims to reduce emissions from urban vehicle ownership. The company is currently building charging sites throughout San Francisco to power its electric vehicles (EVs), but long utility lead times of up to six to eight years constrains this goal. Cruise therefore proposes using a temporary/mobile hydrogen fuel cell trailer to provide an interim power source for charging its EV fleet at a 0.67-acre site at 241 Loomis Street, until a more permanent source of electric power can be provided by the utility or otherwise. The site would charge 30-50 vehicles per day.

The hydrogen fuel cell trailer would be fueled by hydrogen gas that would be brought to the site every 1-2 days, via a refueling trailer provided by a third-party vendor (OneH2). From a noise perspective, the fuel cell and charging trailer will not add any noticeable additional noise to the measured background ambient noise levels in the range of 65-70+ Ldn (day-night average sound levels) of the surrounding area. The only emissions associated with hydrogen fuel cell generation is water vapor. When the water vapor condenses, Cruise anticipates that it will result in approximately 120 gallons of wastewater per day (up to five gallons of water per hour). To dispose of this water, Cruise's preferred option would be to drain directly to the city's storm drain using a standard flexible water hose with an ADA compliant rubber hose ramp atop; however, feedback is requested from the City on whether this setup will be possible. If the project is allowed to discharge waste cooling water into the storm drain for the duration of the project, then a minor encroachment permit may be needed to allow the flexible water hose (with the ADA compliant rubber hose ramp) to cross the existing sidewalk and drain directly into the stormwater system.

Cruise intends to comply with applicable NFPA codes/regulations and following the pre-application meeting with the Department of Building Inspection, Cruise plans to consult with the San Francisco Fire Department for additional permitting requirements, as may be needed.

2.2 Project Background and Need for the Facility

The Cruise AV (autonomous vehicle) platform was first established in 2013, and following years of extensive testing, the AV fleet began providing meal delivery services to vulnerable populations in the City of San Francisco (City) at the start of the COVID-19 pandemic (2020). In early 2022, Cruise began providing limited AV (driver-less) rideshare services to the public within the northwestern segments of the city.

Following the successful limited launch of the public rideshare operations, Cruise has begun planning expansions to Cruise's service area and rideshare offerings. In order to facilitate the planned expansions, there will be an increasing need for more fleet storage and charging locations. Fleet charging capabilities are a critical component of the Cruise operation, as the fleet vehicles are 100% electric and cannot operate without a reliable charging source.

As part of its expansion plans, Cruise has secured a lease for an approximate .67-acre site located at 241 Loomis Street to store and charge fleet vehicles. This location is ideal for fleet storage and charging because the site has an existing entitlement for a private parking lot and it is located in the southeast quadrant of the City, within the planned Cruise expansion area, near the Highway 101 and 280 interchange (see Figure 1, Vicinity Map). The only drawback to this location is that new electric power service will be unavailable for the next two to eight years, which is the anticipated timeline provided by PG&E for their planned transformer upgrade project. Due to the temporary power limitations on site, Cruise has researched alternative temporary power supply options, which has led to the proposed project for a temporary hydrogen fuel trailer to facilitate charging of the fleet vehicles at the proposed location.

2.3 Regulatory Oversight

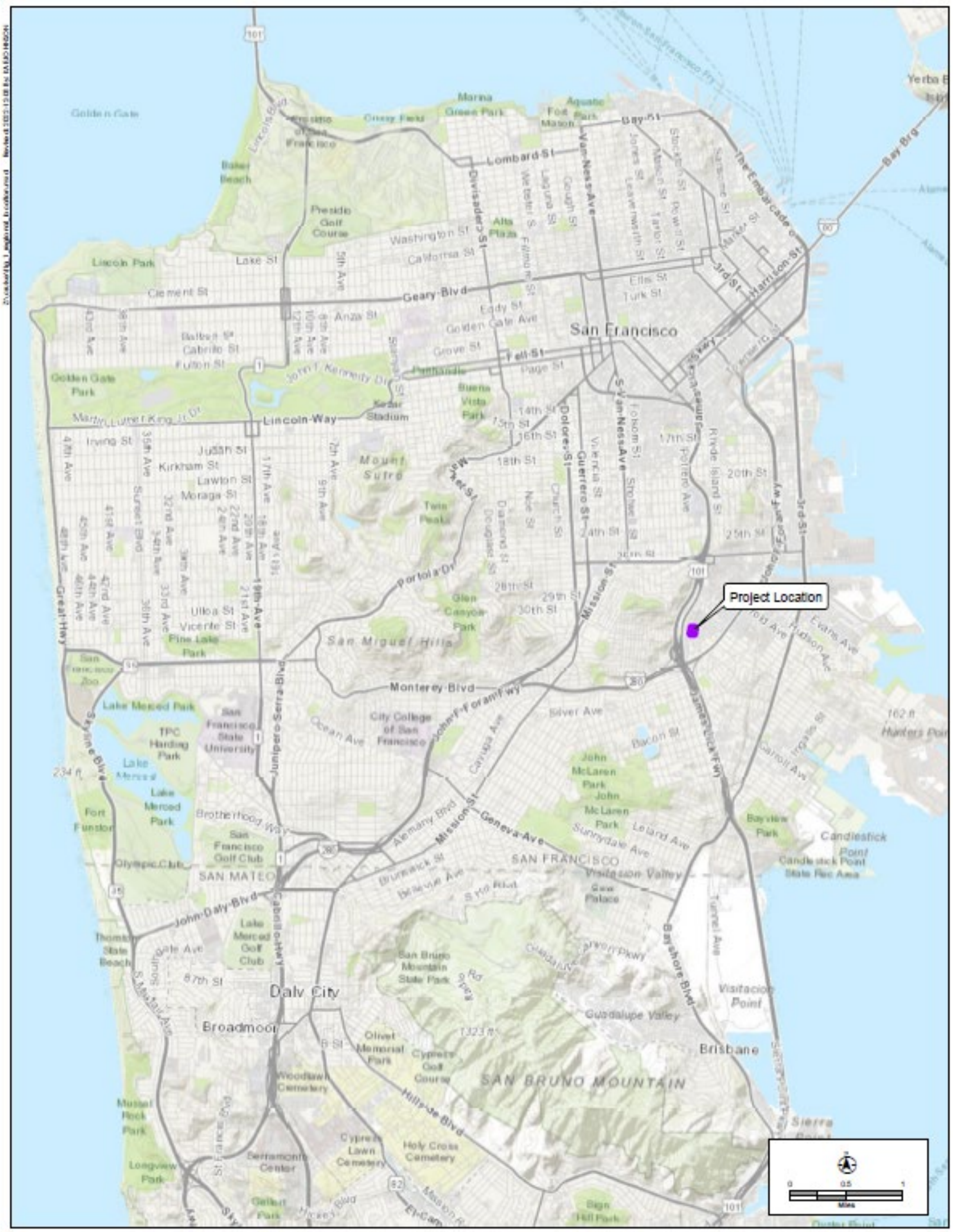
2.3.1 Planning and Zoning Compliance

The project site was legally established as a 'Private Parking Lot' for a taxi company in 2018; however, the taxi company vacated the site in December 2021, which makes it available for grandfathering a new Private Parking Lot use as long as the new business re-tenants the site within 36 months from the prior tenant vacation (or by December 2024)[1]. The proposed temporary hydrogen trailer operation would be considered ancillary to the primary use of the site by Cruise for a private parking lot. This accessory use is classified in the zoning code as 'Fleet Charging,' and it is considered a permitted use when operated in conjunction with a private storage lot (see the San Francisco Municipal Code, Table 210.3, "fleet charging" line item).

The Cruise project management team met with San Francisco Planning staff to discuss the proposal on October 11, 2022. A zoning determination was not given because the activity is ambiguous. Therefore, Planning staff directed the Cruise team to convene a Pre-Application meeting with the Department of Building Inspection to further investigate other Departments' analysis with the introduction of hydrogen power generation. Depending on the feedback provided in the Pre-Application meeting, Planning staff will provide a zoning determination. As stated in Section 1 above, Cruise believes that no component of the temporary hydrogen trailer refueling operation would trigger the need for a new building permit; however, we are seeking concurrence of that opinion through the pre-application meeting requested.

[1] Applicability of the grandfathering provisions were confirmed by Rich Sucre, Planning Department quadrant leader.

Figure 1. Vicinity Map



SOURCE: ESRI 2022; Stantec 2022

Cruise SF Hydrogen Trailer Project

2.3.2 Fire Department

Assuming no building permit is required for the temporary mobile use, the project still involves storage and handling of hydrogen gas, which is a flammable substance and will likely require an operational permit from the San Francisco Fire Department[2]. The proposed project will comply with applicable NFPA codes/regulations and following the pre-application meeting with the Department of Building Inspection, Cruise plans to consult with the San Francisco Fire Department for additional permitting requirements, as may be needed.

2.3.3 Public Works

No permits are anticipated from the City's Department of Public Works; however, if the project is allowed to discharge waste cooling water into the storm drain for the duration of the project, then a minor encroachment permit may be needed to allow a flexible water hose (with an ADA compliant rubber hose ramp atop) to cross the existing sidewalk and drain directly into the stormwater system. Following the pre-application meeting with the Department of Building Inspection, Cruise plans to consult with the Department of Public Works for additional requirements, as may be needed.

2.3.4 Environmental Health

The proposed project involves the handling and storage of up to 230 kilograms (or 97,359 standard cubic feet) of hydrogen fuel on site at any given time, which is assumed to require registration and regulation by the Hazardous Materials (HM) and Waste Program of the City and County of San Francisco[3]. As required by the program, Cruise will notify, submit necessary forms, and pay fees to obtain a Certificate of Registration. As part of the certification process, an emergency response/contingency plan will be prepared, along with Hazardous Materials Inventory and Hazardous Waste Inventory statements, a training plan, and an HM reduction plan[4]. Following the pre-application meeting with the Department of Building Inspection, Cruise plans to consult with the Department of Public Health, Environmental Health branch, for additional requirements, as may be needed.

2.4 Proposed Project Details

2.4.1 Existing Conditions

The project site is approximately 0.67 acres in size and rectangular shaped with street access on the west side only (from Loomis Street). The north, east and south property boundaries are bordered by existing industrial buildings with zero setbacks. The site is flat and paved, with an existing wrought iron fence spanning the entire western property

[2] Telephone discussion with Roger Ly at the SF Fire Department on 12/8/22
[3] Telephone discussion with Andrea Leon at the SF Department of Environmental Health, Hazardous Materials Program on 12/7/22
[4] Certificate of Registration requirements listed here: https://www.sfdph.org/dph/EH/HMUPA/HMRegistration.asp

boundary, limiting public access from the street. Within the site there are four existing privately owned overhead lights for parking lot lighting that are currently in operation and served by PG&E's existing electrical network, in addition, there are temporary solar-powered security cameras, stationed throughout the site on stands with wheels. A small office/restroom trailer facility for onsite Cruise employees is currently on the site, and Cruise is awaiting building permits relating to the installation of a portable guard shack.

Figures 2 and 3 below, provide an aerial view of the existing site (prior to office trailer placement) and street view photo taken in mid-2022.

2.4.2 Land Use and Adjacent Uses

The site has a General Plan land use designation of Industrial, and is zoned PD-2 (Production, Distribution and Repair), with unrestricted commercial hours of operation. Immediately north of the site are two industrial buildings that appear to be vacant, with a United Rentals facility located just beyond those sites. To the east is a full block of industrial building space housing a variety of uses including the local iron workers union office and training facility, a switchgear supply store, a Mr. Rooter Plumbing, a ceramic tile design warehouse, and a dance club space that operates on Friday and Saturdays only. Immediately south of the site is another vacant industrial building, followed by a Work Site Labs location, and the Big City Montessori School at the corner of Loomis Street and Industrial Street (this use is approximately 215 feet south of the site). To the east of the site, across Loomis Street, is a Lowes Home Improvement store and additional private vehicle storage lots.

2.4.3 Proposed Site Plan and Operations

The proposed project includes minimal changes to the existing site. As shown on the site plan (Figure 4), parking on site is proposed to be laid out in a manner that will accommodate approximately 30 to 50 vehicles; however, that number could change depending on operational demands. No paving is proposed, as the lot has recently been repaved, and the existing wrought iron fence along the street frontage would remain in place; however, the access gate controls would be upgraded to facilitate smoother electronic site access operations. Equipment proposed to be brought on site for the use would include:

1) a Mobile Energy Command (MEC) hydrogen fueled trailer with four mobile vehicle charge ports; and
2) a hydrogen refueling trailer (including portable gas module to regulate hydrogen fuel pressure during refueling events) to fuel the ongoing operation of the MEC.

Figure 2. Aerial Photo

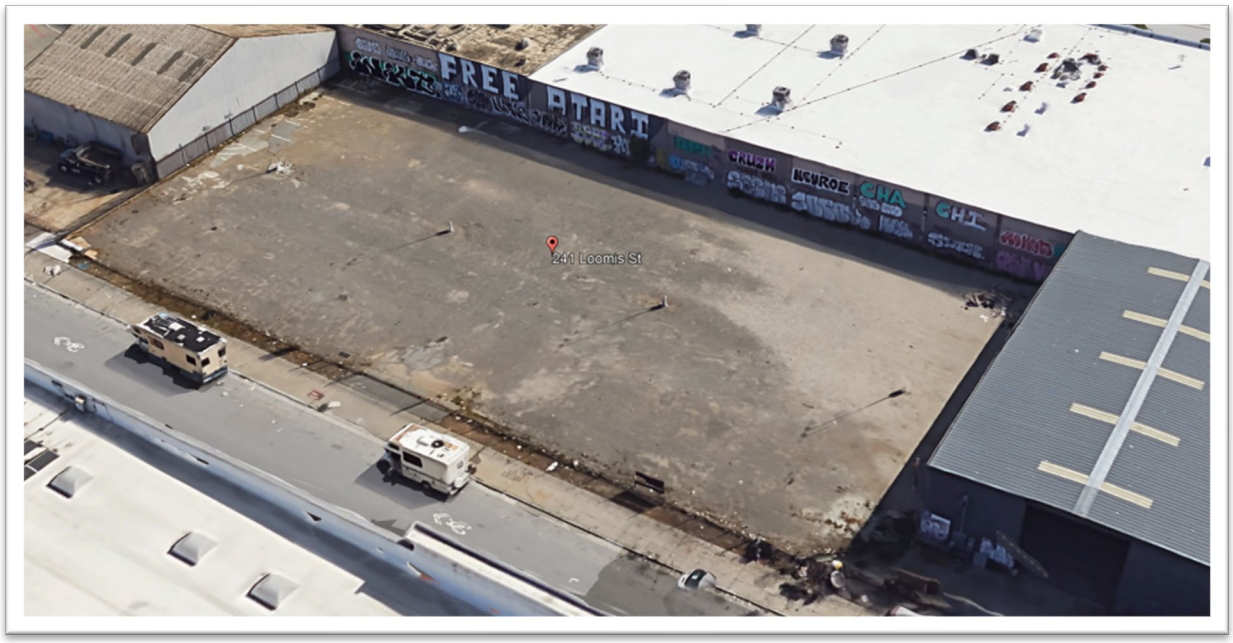


Figure 3. Street View

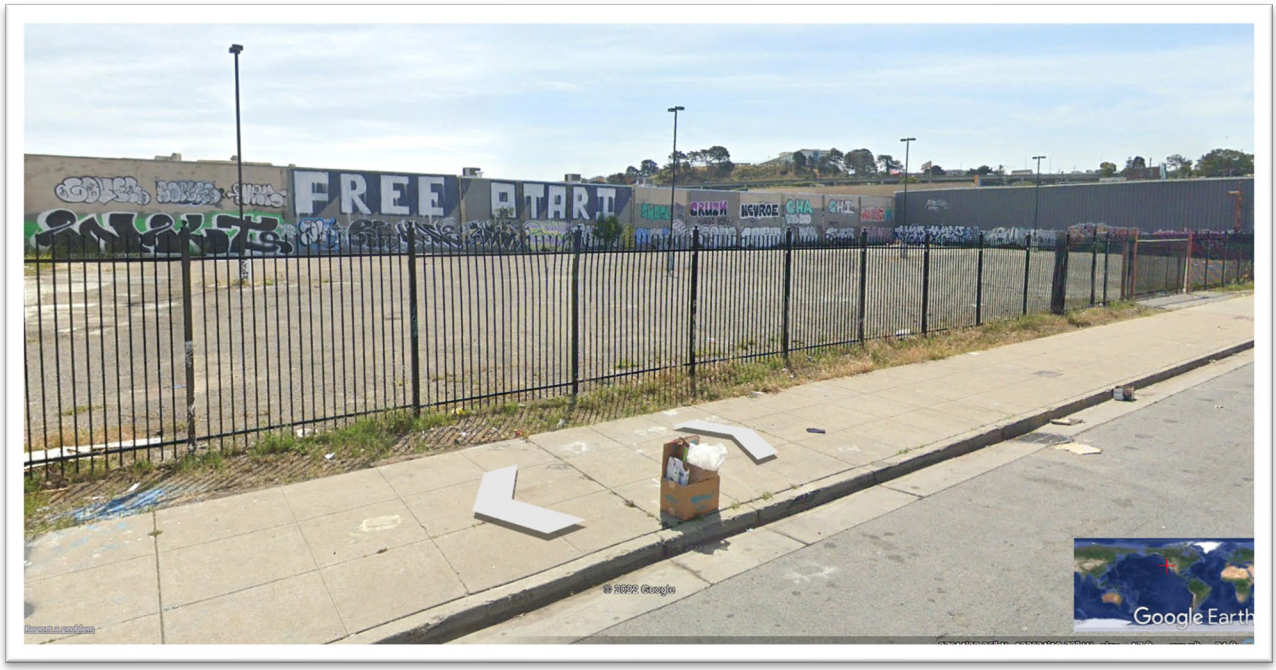
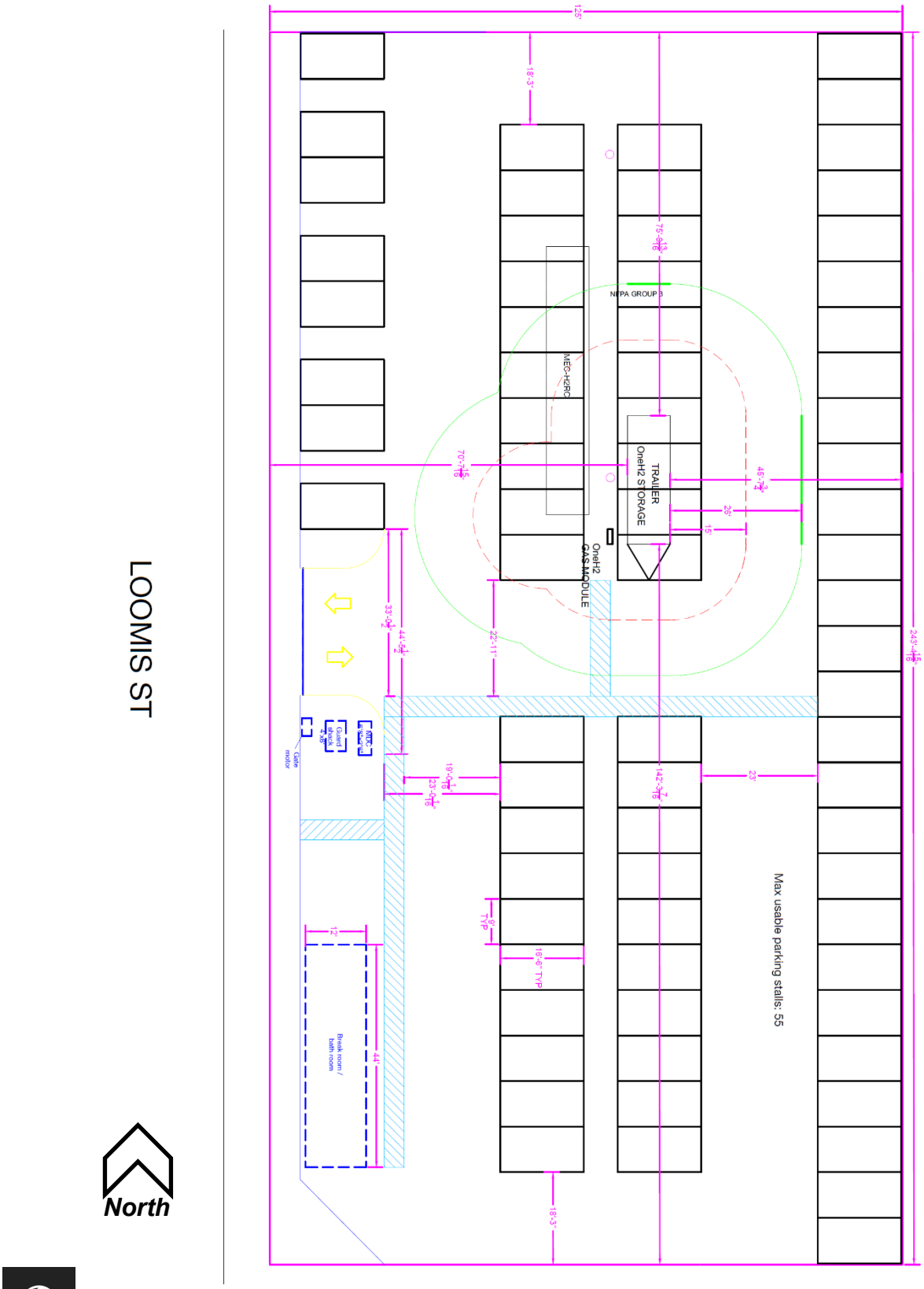


Figure 4. Site Plan



Overall, the site is intended to be operational 24 hours per day, 7 days per week. Regarding security and staffing, there are expected to be approximately five persons on site at any given time. The onsite crew members would provide security for the facility, facilitate fuel trailer hook-up connections/detachments, and shuffle fleet vehicles around as needed to facilitate necessary charging activities. Access to the site will be heavily controlled and restricted using the upgraded security access gate and the security guard personnel who would be stationed at the guard shack near the site entrance. New permanent security cameras will also be added in various locations around the site to ensure adequate surveillance of all activities on site, at all times.

2.4.3.1 MEC Trailer *(to be provided by Renewable Innovations)*

Within the center of the site between two existing light poles, an approximately 10-foot by 60-foot space would be set aside for long-term parking of the MEC trailer, which would serve as the hub for vehicle charging on site. The MEC trailer (and refueling trailer) would be located a minimum of 26-feet away from any other structures to meet the NFPA recommended minimum distance setbacks for outdoor bulk hydrogen compressed gas systems. The MEC trailer is expected to remain parked on site and in place for the life of the project, or until such time as a new permanent energy service can be obtained from PG&E (which is anticipated to take two to eight years).

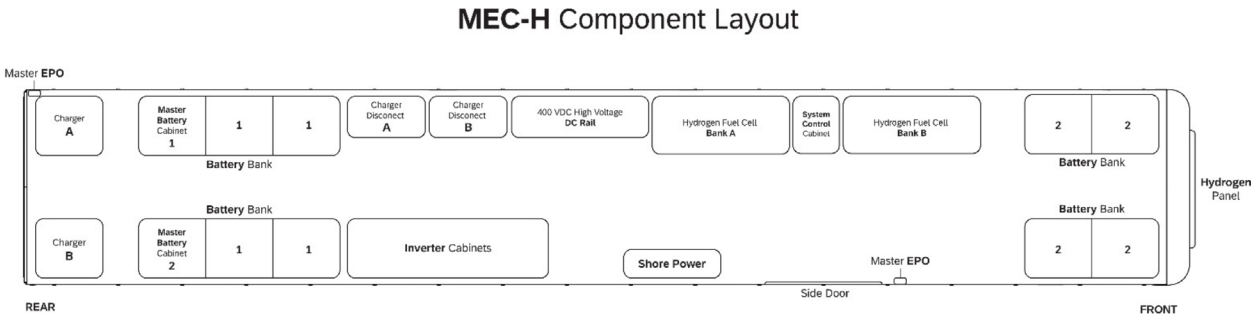
The MEC trailer (pictured in Figure 5) would include four mobile EV rapid charging ports to facilitate simultaneous rapid charging of up to four vehicles at a time. The trailer would provide its own universal power supply (UPS) by means of a built-in power generator which would be fueled by the hydrogen fuel cells/pods (see the hydrogen refueling trailer details below). The MEC power generation would operate through battery banks inside the trailer (see the trailer component layout in Figure 6) and would provide a continuous power generation potential of up to 250 kilowatts (kW). This type of power generation differs from a more traditional diesel generator in that it produces zero carbon emissions and is silent and vibration free. Other components inside the trailer include a 560-kW scalable inverter, 500 kWhr battery storage, cooling fans, and advanced local and remote power management controls. A detailed list of component specifications and a certification summary is available in Appendix A of this report.

<u>Fuel Cell Water</u>

The hydrogen fuel cell reaction would operate near continuously and generate water as its only emissions product. This water would drain through pipes located near the front driver's side of the trailer. Based on the estimated fuel consumption rate for the project, the MEC trailer is anticipated to produce approximately 120 gallons of wastewater per day (up to 5 gallons per hour), which will need to be removed from the site regularly. According to the hydrogen mechanical trailer manufacturer, the wastewater includes no contaminants or priority pollutants, and as such, Cruise believes it would be clean enough to qualify for a waiver under the City's existing MS4 permit, allowing for drainage into the storm drain system. Third party testing of the wastewater is underway to confirm its contents and results should be available by the end of December.

Figure 5. MEC Trailer (On Site Simulation)

Figure 6. MEC Trailer Component Layout



With regards to removal of the wastewater, as stated above, Cruise's preferred option is to drain directly into the storm drain using a standard flexible water hose with an ADA compliant rubber hose ramp atop; however, feedback is requested from the City on whether this setup could be possible. Alternative removal options might include a more permanent drainage feature to reach the storm drain system, or trucking water off site for repurposing or disposal elsewhere.

2.4.3.2 Hydrogen Refueling Trailer *(to be provided by OneH2)*

Adjacent (parallel) to the MEC trailer, an approximate 10-foot by 35-foot space would be set aside for parking the hydrogen refueling trailer, which would support the ongoing and continuous MEC trailer operation (and subsequent Cruise fleet charging). This refueling trailer is currently anticipated to be provided by OneH2 and would be swapped out every one to two days, depending on actual fuel usage. Each OneH2 trailer would consist of a conventional triple axel gooseneck hitch trailer (see Figure 7 on next page) that would be towed by a standard Ford F-350 (or similar) vehicle. Each trailer would contain two Department of Transportation (DOT) certified high pressure cylinder carriers (or fuel "pods"), with each pod holding 12 individual cylinders for transport of compressed hydrogen gas. Each cylinder would have a capacity of 9.5 kilograms at 7,500 pounds per square inch gauge (psig). The total hydrogen fuel capacity (maximum gas payload) for each full trailer (24 cylinders) would be 230 kilograms (or 97,359 standard cubic feet) and the total weight of all fuel pods on each trailer would be 17,400 pounds (or 8,700 pounds per fuel pod). A copy of the current DOT certification permit, and additional trailer details and specifications are included as Appendix B and C of this report.

Once parked in place at the site, the hydrogen fuel trailer would be connected by hand to the MEC trailer using a flexible hose with custom fittings, and the two trailers would remain connected for the duration of the hydrogen fuel consumption process (by the MEC trailer operations). Once a fuel trailer has been completely depleted (this would be dictated by the actual consumption rate but is currently estimated to occur every two days), it would be disconnected from the MEC and swapped out with a new trailer of all the same specifications. Each change-over of fuel trailers would occur in a single event and would be handled by the 3rd party supplier (OneH2). The change-over process would include disconnecting the fuel hose from the MEC trailer, clearing out the empty trailer (to be sent back to the supplier's facility), moving the new trailer into position, and then reconnecting the fuel hose back into the MEC.

Figure 7. OneH2 Trailer

2.5 Life Safety Controls

2.5.1 Hazardous Materials and Waste Program Participation

As mentioned above, the proposal will be subject to the San Francisco Department of Public Health, Environmental Health, Hazardous Materials and Waste Program requirements. As part of that program, the site will be registered and monitored on a regular basis for compliance with all applicable laws and regulations relating to the storage and use of hydrogen fuel.

2.5.2 Emergency Response Plan (for Refueling Activities)

A communication process map (Appendix D) has been prepared to detail and streamline the communication protocol between OneH2 and Cruise regarding the hydrogen refueling infrastructure. Should any problems be detected, at any time, the process map lays out the steps to be taken to efficiently resolve the problem. In addition, the MEC Trailer Quick User Guide (Appendix E) contains an emergency protocol for on site operators to follow in the event of a suspected emergency or pre-emergency situation. The MEC also includes extensive safety labeling, which are pictured in an inventory list (Appendix F).

2.5.3 Hydrogen Fuel Leak Controls

If a leak were to occur, the nature of hydrogen is that it moves straight up very quickly, at a rate of 30 mph, so it would dissipate into the atmosphere very quickly. The fuel tanks

on the OneH2 trailer have many safety features incorporated and they have been built to withstand significant impacts and/or damage that could occur from either natural or man-made incidents (incidents would be most likely to occur during transport and not during operation). Appendix C includes more specific details about these features, but in general, they include cylinder packaging protection built to withstand significant static forces up to 8 times its weight, as well as primary and secondary containment features on board.

2.5.4 Site Safety Collision Controls

As stated in the OneH2 trailer specifications (Appendix C), the refueling trailer and hydrogen gas cylinders have extensive collision protection that includes “static force of 8 times weight applied in three axes” and “simultaneous static forces of (weight) 7 times longitudinal, 3 times lateral and 3 times vertical.” The refueling trailers are also certified by the DOT (see Appendix B), which includes an extensive process involving special packaging requirements, hydraulic pressure proof testing, visual inspections, and other general operational controls. According to the site plan above, the refueling trailers would be parked on the east side of the MEC trailer, providing an additional layer of screening and protection from the public street. Regarding the MEC Trailer, its placement on site would be off-set from the main vehicular entrance aisle to provide sufficient space for on-site circulation and buffer from other vehicles, and the entire site will remain secured from any other public access by means of the existing wrought iron fencing and vehicular access gate.

2.6 Other Environmental Notes

2.6.1 Noise

The proposed hydrogen refueling operation is not expected to be a source of any new significant noise. According to a background noise mapping study that was done in 2009 (see the San Francisco General Plan, Transportation Noise section), the specific site had existing background ambient noise levels in the range of 65-70 Ldn (day-night average sound levels), and the sites immediately adjacent were in the 70+ Ldn range primarily due to their close proximity to Highway 280.

Since 2009, ambient noise levels have only increased in the area. The proposed hydrogen fuel trailer operation on site (including cooling fans) is not expected to produce any noises in excess of the existing background ambient noise levels.

2.6.2 Emissions

One of the most noteworthy benefits of electric vehicles and the proposed hydrogen fueling operation, is that they would produce zero carbon emissions on site. Truck trips to and from the site for trailer exchanges and potential wastewater repurposing/recycling

activities would produce some localized emissions; however, the low overall volume (approximately 1 truck trip every 1-2 days) would be negligible from an emissions standpoint.

APPENDIX

Appendix A. MEC Component Specifications and Certification Summary
Appendix B. Dot Certification Permit
Appendix C. OneH2 Trailer Specification and Gas Module Assembly
Appendix D. Communication Process Map
Appendix E. MEC Trailer Quick Operation Guide
Appendix F. MEC Trailer Safety Label
Appendix G: Site photos

Appendix A.

MEC Component Specifications and Certification Summary

Renewable Innovations – MEC-H2RC

Rebelle Rally October 2021

Mobile Energy Command- H2 Rapid Charging

- 250kW H2 Power (Fuel Cells)
- 560 kW Scalable Inverter Power
- 500 kWhr Battery Storage
- Dual 180- kW DC Rapid Chargers (4 Charge Ports)
- Advanced local and remote Power management & control

RENEWABLE INNOVATIONS
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Clean
Scalable
Power

Renewable Innovations Proprietary

MEC-H Certification Summary

Inverter

Grid Interconnection (In Final Process):

- USA: UL1741/IEEE 1547
- EU: EN50549
- Australia: AS477
- USA: UL1741/IEEE 1547
- EU: EN50549
- Australia: AS477

Safety:

- USA: UL1778
- Worldwide: CE mark, IEC 62040 1/EN62040-1 Edition 2017
  - IEC62109-1
  - IEC62109-2
  - IEC62040-1
  - IEC62040-2
  - IEC61000-3-2
  - IEC61000-4-2
  - IEC61000-4-3
  - IEC61000-4-4
  - IEC61000-4-5
  - IEC61000-4-6
  - IEC61000-4-8
  - CISPR32- class A
  - FCC 47 CFR Part 15 – Class A
    - IEC62477-1
    - AS4777-2
    - EN50549-1
    - VDE4105-AR

Inverter

(Designed To)

- ISO 23273
- SAE2578
- ISO 6469 (as applicable)
- Enclosure IP55

Batteries

- ANSI/CAN/UP 19732018

Bidirectional Buck-Boost

- E-13

Renewable Innovations Proprietary – Confidential

RENEWABLE INNOVATIONS
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Clean Scalable Power

Certification - General

- General – H2
  - NFPA 2 2020
  - ISO 26262
  - ANSI/CSA FC 1-2014 – Fuel cell technologies
- Fuel Cell (Please refer to "System Safety Case V1.2")
  - IEC 60479
  - IEC 60479-1
  - IEC 60529
  - ISO 13732-1
  - ISO 6722
  - SAE J1128
  - SAE J2578
  - SAE J2601
  - UN-ECE-134
  - NEPA 70E
- Battery (Please refer to "PSDS N2.2 LI Battery")
  - UN No 3480 / class 9
  - UN38.3.
  - 49CFR 173.185.
- General Electronics and Electrical
  - Grid Interconnection (In Final Process):
    - USA: UL1741/IEEE 1547
    - EU: EN50549
    - Australia: AS477
  - Safety:
    - USA: UL1778
    - Worldwide: CE mark, IEC 62040 -1/EN62040-1 Edition 2017
  - Safety:
    - USA: UL1778
    - Worldwide: CE mark, IEC 62040 -1/EN62040-1 Edition 2017

Appendix B.

DOT Certification Permit

January 09, 2020

U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety Administration**

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

DOT-SP 14576
(ELEVENTH REVISION)

EXPIRATION DATE: 2023-01-31

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Structural Composites Industries (SCI)
Pomona, CA

2. PURPOSE AND LIMITATIONS:

a. This special permit authorizes the manufacture, marking, sale, and use of a non-DOT specification cylinder for the transportation in commerce of the materials authorized by this special permit. The non-DOT specification cylinders conform to all regulations applicable to fully wrapped carbon-fiber reinforced aluminum lined cylinders (CFFC) except as specified herein. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.

b. The safety analyses performed in development of this special permit only considered the hazards and risks associated with transportation in commerce. The safety analyses did not consider the hazards and risks associated with consumer use, use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.

c. In accordance with 49 CFR 107.107(a) party status may not be granted to a manufacturing permit. These packagings may be used in accordance with 49 CFR 173.22a.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 172.101 Table, Column (9B) in that the quantity limitation for cargo aircraft is exceeded; and §§ 173.302a(a)(1), and 173.304a(a)(1) in that non-DOT specification cylinders are not authorized, except as specified herein.

5. BASIS: This special permit is based on the application of Structural Composites Industries dated July 22, 2019, submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Air, compressed (containing up to 39% by volume oxygen content)	2.2	UN1002	N/A
Argon, compressed	2.2	UN1006	N/A
Carbon dioxide	2.2	UN1013	N/A
Carbon monoxide, compressed	2.3	UN1016	N/A
Compressed gas, flammable, n.o.s.	2.1	UN1954	N/A
Compressed gas, n.o.s.	2.2	UN1956	N/A
Compressed gas, oxidizing, n.o.s.	2.2	UN3156	N/A
Helium, compressed	2.2	UN1046	N/A
Hydrogen and carbon monoxide mixture, compressed	2.3	UN2600	N/A
Hydrogen, compressed	2.1	UN1049	N/A
Krypton, compressed	2.2	UN1056	N/A
Liquefied gas, n.o.s.	2.2	UN3163	N/A

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Methane, compressed *or* Natural gas, compressed (with high methane content)	2.1	UN1971	N/A
Neon, compressed	2.2	UN1065	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Nitrous oxide	2.2	UN1070	N/A
Oxygen, compressed	2.2	UN1072	N/A
Sulfur hexafluoride	2.2	UN1080	N/A
Xenon, compressed	2.2	UN2036	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING: Prescribed packagings are fully wrapped carbon-fiber reinforced aluminum lined cylinders made in conformance with the Basic Requirements for Fully Wrapped Carbon-Fiber Reinforced Aluminum Lined Cylinders (DOT-CFFC Fifth Revision), dated March 2007, and with the SCI design drawings, titled "Envelope Drawing Wound Pressure Vessel" (Drawing #'s 1275154, 1274655 and 1274986), on file with the Office of Hazardous Materials Safety Approval and Permits Division (OHMSAPD); except as follows:

(1) **CFFC-2 (Size and Pressure)** – Cylinders made under this special permit are limited to a maximum water volume and service pressure of 315 liters (709 lb) and 517 bar (7,500 psi) respectively, and are subject to the following:

(2) **CFFC-6(a) (Tensile Tests)** – The tensile specimens may be cut from a sample of representative liner material that has been heat treated in the same heat treatment batch as the all liners for which it represents. Samples of test materials must be of the

same material properties as the liner materials it represents;

(3) **CFFC-10(c) (Drop Tests)** – one cylinder complete with valve must be subjected to a drop test in accordance with ISO 11119-2:2002, section 8.5.8;

(4) **CFFC-10(g) (Gunfire Test) –** The cylinder (tube) shall be positioned so that the projectile impact point is in the tube sidewall. A 50 caliber gun may be used for thick wall tubes. During the gunfire test, the distance from the firing location to test tube must not exceed 50 yards. If the wall is not penetrated, it is also permissible to fire additional bullets into the same area until the wall is penetrated. Tested tubes shall reveal no evidence of a fragmentation failure. Results of the tests must be recorded.

(5) **CFFC-10(h) (Bonfire Test) –** Two cylinders must be tested in accordance with all requirements of CFFC-10(h) except the cylinders are in a horizontal position instead of a vertical orientation. The pressurized gas may be vented from other areas of the PRD valve assembly (e.g. melted o-ring) which are affected by intense heat.

(6) **CFFC-14(iv) –** The REE marking does not apply.

b. Requalification:

(1) Hydraulic pressure proof test - Each cylinder must be requalified once every 5 years by a qualified person holding a valid DOT RIN using a hydraulic proof pressure test equal to 1.5 times the marked service pressure. The pressure must be held for a minimum of 3 minutes without a loss of pressure. The hydraulic pressure proof test may be substituted by a pneumatic pressure proof test subject to the following conditions:

(i) The testing facility is prepared and approved for pressure proof test based on a documented risk assessment and failure mode and effect analysis;

(ii) Each cylinder is pressurized to 1.25 times the marked service pressure. The pressure must be held for 10 consecutive minutes. The loss of pressure during the hold time must not exceed 5% of the original test pressure;

(iii) In case of equipment failure during the test which results in loss of pressure prior to the completion of the 10-minute hold time, the test may only be repeated one time, at a pressure of 1.27 times the marked service pressure;

(iv) A cylinder that fails to maintain the test pressure must be evaluated to determine the cause. A cylinder that shows evidence of damage (surface distortion, unraveled fibers or other evidence of weakness) must be evaluated in accordance with the visual inspection procedure described in this special permit.

(2) Visual Inspection - Each cylinder must be visually inspected in accordance with CGA Pamphlet C-6.2 Guidelines for Visual Inspection and Re-qualification of Fiber Reinforced High Pressure Cylinders", except as specifically noted herein:

(i) Cylinders with fiber damage (cuts, abrasions, etc.) that exceeds Level 1 type damage as defined in CGA Pamphlet C-6.2 and meet the following depth and length criteria are considered to have Level 2 damage:

(A) Depth - Damage that upon visual inspection is seen to penetrate the outer fiberglass layer but does not expose the carbon layer beneath, or that has a measured depth of greater than 0.005 inch and less than 0.045 inch for cylinders with an outside diameter greater than 7.5 inches or less than 0.035 inch for cylinders 7.5 inches or less in outside diameter;

(B) Length - Damage that has a maximum allowable length of:

Region	Direction of fiber damage	Maximum length of damage
Cylinder sidewall and domes	Transverse to fiber direction (longitudinal direction)	20% of the straight sidewall section length
Cylinder sidewall and domes	In fiber direction (circumferential direction)	20% of the straight sidewall section length

(ii) Cylinders with damage that meet the Level 2 criteria must be rejected. Retesters must contact the cylinder manufacturer in the event that the damage cannot be clearly interpreted based on these criteria. Repair of rejected cylinders is authorized for Level 2 type damage. Repairs must be made in accordance with CGA Pamphlet C-6.2, prior to the hydrostatic pressure test. Repairs must be evaluated after the hydrostatic test.

(iii) Cylinders that have direct fiber damage that penetrates through the outer fiberglass layer and into the carbon layer, or that have a measured damage depth of greater than the Level 2 maximum are considered to have Level 3 type damage. Cylinders that have damage with depth meeting Level 2, but length exceeding the Level 2 maximum are considered to have Level 3 type damage. Cylinders with Level 3 type damage are not authorized to be repaired, and must be condemned.

(iv) A hydrostatic requalification may be repeated as provided in § 180.205(g); only two such tests are permitted. Pressurization prior to the official hydrostatic test for the purpose of a systems check may not exceed 85% of the minimum required test pressure.

(3) Persons who perform inspection and testing of cylinders subject to this special permit must comply with § 180.205(b) and with all the terms and conditions of this special permit.

(4) The requalification date (month/year) must be permanently marked on the cylinder as specified in CFFC-14. The marking of the RIN symbol on the cylinder certifies compliance with all of the terms and conditions of this special permit.

c. OPERATIONAL CONTROLS:

(1) A cylinder manufactured under this special permit must be removed from service after 15 years from the date of manufacture.

(2) Cylinders filled with mixtures of carbon monoxide and hydrogen must not contain a moisture content in excess of 50 parts per million.

(3) The maximum quantity authorized for cylinders containing mixtures of carbon monoxide and hydrogen is 25 kilograms (kg).

(4) A cylinder that has been subjected to fire may not be returned to service.

(5) Cylinders used in oxygen service must conform with § 173.302a(a)(5)(i-iv).

(6) Cylinders used in nitrous oxide service must conform with § 173.304a(a)(1).

(7) Cylinders must be manifolded in accordance with the requirements of § 173.301(g).

(8) Transportation of Division 2.1 (flammable gas) materials is not authorized aboard cargo vessel and aircraft unless specifically authorized in the Hazardous Materials Table (§ 172.101).

(9) Transportation of oxygen is only authorized aboard aircraft when in accordance with § 175.501.

(10) Cylinders may not be used for underwater breathing purposes.

(11) The cylinders are permanently mounted within a structural frame during transportation. Structural framework that is intended for transportation of the cylinders under this special permit must have an appropriate engineering calculation (e.g. Finite Element Analysis (FEA)). The report must be submitted to the Office of Hazardous Materials Special Permits and Approvals. The calculation must demonstrate the framework's ability to protect the cylinders from catastrophic damage (rupture) due to front, rear, or side impact, and rollover. As a minimum, the frame must be designed to meet the following:

(i) All requirements of § 173.301(i);

(ii) The frame design must meet all requirements of CGA TB-25.

(12) All cylinders must be operated and maintained in accordance with Structural Composites Industries Cylinder Component Operations Manual.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this special permit for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this special permit.

b. A person who is not a holder of this special permit, but receives a packaging covered by this special permit, may reoffer it for transportation provided no modification or change is made to the packaging and it is offered for transportation in conformance with this special permit and the HMR.

c. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.

d. A current copy of this special permit must be maintained at each facility where the package is manufactured under this special permit and must be made available to a DOT representative upon request.

e. Each packaging manufactured under the authority of this special permit must be either: (1) marked with the name of

the manufacturer and location (city and state) of the facility at which it is manufactured; or (2) marked with a registration symbol designated for a specific manufacturing facility by the Office of Hazardous Materials Special permits and Approvals for a specific manufacturing facility.

f. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.

g. When authorized for transportation by cargo vessel as prescribed in § 172.101, Hazardous Materials Table, flammable gases covered by this special permit must be packed within a closed freight container of steel construction.

h. Each cylinder must be plainly and durably marked "DOT-SP 14576" as specified in §§ 172.302(b) and (c). Additionally, each framework must be marked "DOT-SP 14576".

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, and cargo aircraft only.

10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft or motor vehicle used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
- Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) – "The Hazardous Materials Safety and Security Reauthorization Act of 2005" (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term "exemption" to "special permit" and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 Immediate notice of certain hazardous materials incidents, and 171.16 Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:

Duane M. Cassidy

for William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Material Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm
Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: BrMoore/kah

Appendix C.

One H2 Trailer Specifications and Gas Module Assembly Details

OneH2 230 Kg 7500 PSIG Hydrogen Gas Trailer

Overview

- The OneH2 230 Kg 7500 PSIG Hydrogen Gas Trailer is a conventional triple axle gooseneck hitch trailer consisting of two DOT high pressure cylinder carriers each in 12 Cylinder Package ("12 Pack") form.
- Each 12 Pack is configured into two 6 cylinder manifold 'Banks'.
- Each trailer in total carries 24 cylinders configured in four Banks with a total Hydrogen Gas payload of 230 Kg @ 7500 PSIG.

Individual Cylinders

- Design: Worthington Type 3
- Permitted Under: DOT SP 14576_9th Rev.
- Nominal Specifications
    - Diameter: 17.5"
    - Length: 120"
    - Liquid Capacity: 305 Liters
    - Working Pressure: 7,500 PSIG
    - Hydrogen Gas Capacity: 9.5 Kg
    - Weight (less Valves & TPRD's): 520 lb.

Cylinder Carrier ("12 Pack")

- Number of Cylinders Per Carrier 12
- Cylinders fully enclosed in structural frame
    - Cylinders fully protected from road debris / sunlight
    - Cylinders strap mounted in S/S frames
    - 11 GA S/S structural parts
    - 16 GA S/S panels
    - Four vent apertures
    - Four ½" Chain Plates for use when lifting carrier, affixed topside
- Nominal Specifications:
    - Gross Weight of Package 8,700 lb.
    - Maximum Hydrogen Gas Payload 115 Kg
    - Carrier Length 143 ½"
    - Carrier Width 79"
    - Carrier Height 64 ¼"
- Cylinder Protection
    - Prior to Deformity of the Packaging
        - Static force of 8 times weight applied in three axes

        - Simultaneous static forces of (weight) 7 times longitudinal, 3 times lateral and 3 times vertical
- TPRD & Vent Construction:
    - Two SHERWOOD 3132SB9-95 TPRD's
    - Each TPRD individually vented through ½" seamless S/S pressure pipe, clamped to vent vertically, capped with rubber stoppers
- Containment
    - Primary containment, S/S Quarter Turn Cylinder valves, one per cylinder, rated 10,000 PSIG
    - Secondary containment
        - Two Manifolds interconnected to 6 cylinders each
        - Manifolds have a vent port (for bleeding down the manifold prior to disconnect and travel)
            - Vent Port is piped to vent vertically with TPRD vent tubes
        - Manifolds include a pressure gauge rated to 15,000 PSIG
        - Interconnecting hose port is via a male high pressure ORFS fitting, capped during travel.
    - Access
        - Manifold Access is via an aluminum roller shutter
    - Serial Plate & Travel Documents
        - S/S Serial Plate and travel documents are attached to an aluminum document box adjacent the manifold when lifting the roller shutter

Trailer

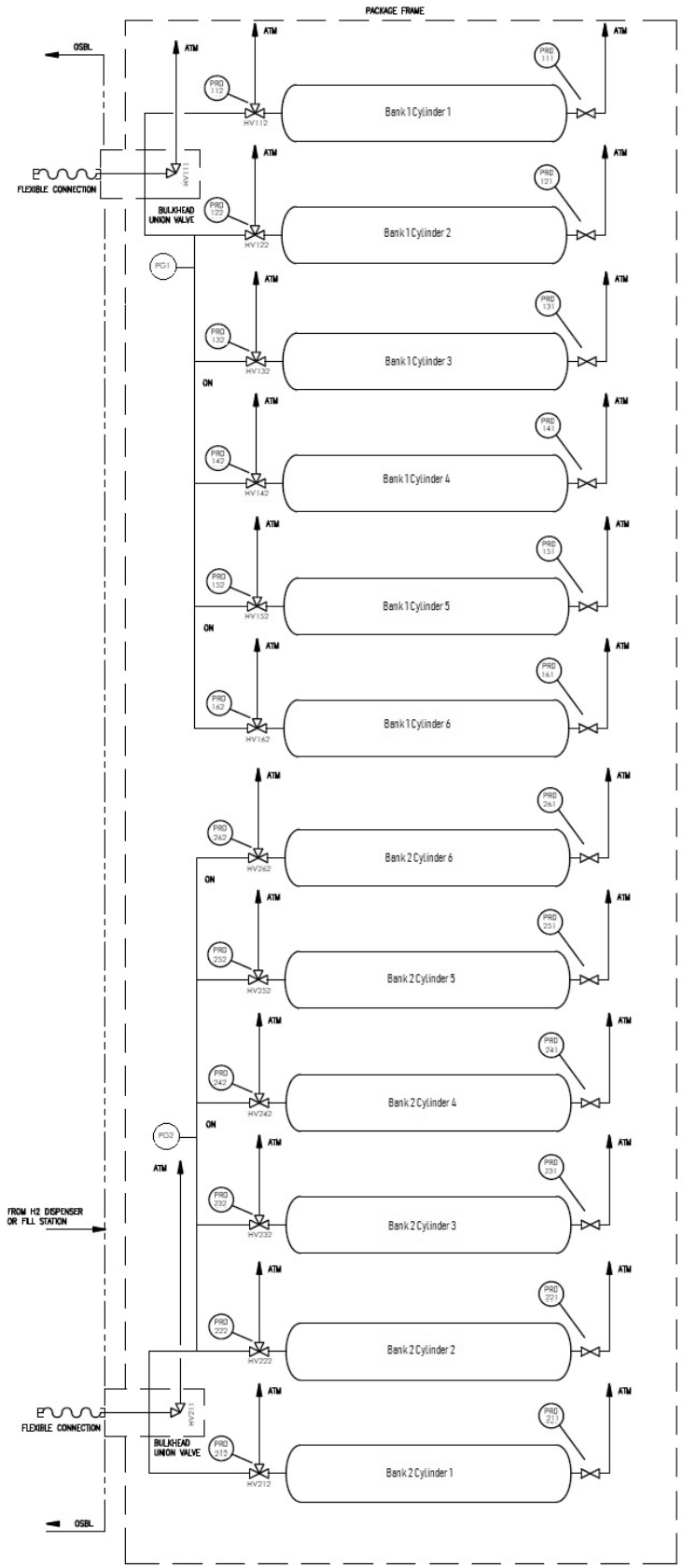
- Steel Gooseneck low deck trailer, steel checker plate deck
- Twin Hydraulic Jack Stands
- Triple 9,000 lb. Axles, each axle with electric brakes
- Nominal Trailer Weight of 5,400 lb.
- Two 12 Packs mounted end to end, combined weight of 17,400 lb.
- 12 Packs Strapped to deck with four 10,000 lb. rated ratchet straps
- Can be legally hauled, fully loaded by a Chevrolet 3500 DRW or equivalent
- Nominal Specifications
    - Weights
        - Fully Loaded Trailer Weight of 22,800 lb.
        - Trailer GVWR 27,000 lb.
        - Maximum Hydrogen Payload of 230 Kg
    - Dimensions
        - Deck Length 298"
        - Deck Width 80"
        - Trailer Length Overall 32.5'
        - Trailer Width 101"

Trailer Hose Points

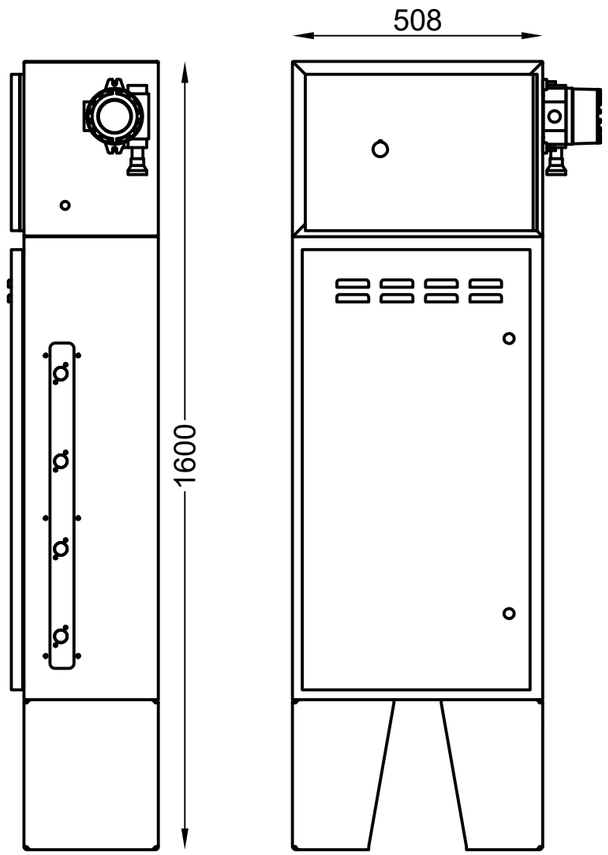
- Each Trailer has two 12 Packs, each 12 packs has two hose ports with custom ORFS fittings that terminate in conventional MP 3/8” cone and thread hose fittings.
- Trailer Designed to interface to OneH2 Outdoor Gas Box (Sold Separately / Separate Specifications)

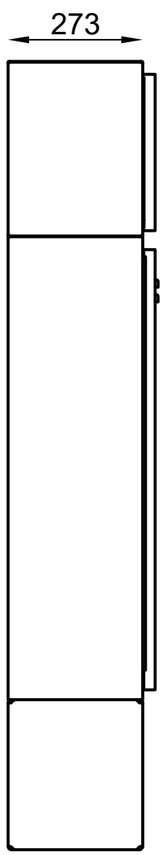
Typical In-Situ Arrangement

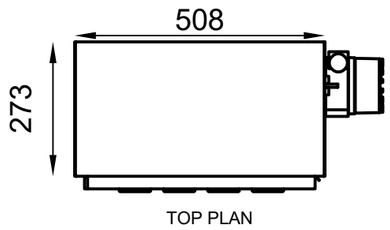
System P&ID (Per 12 Pack)

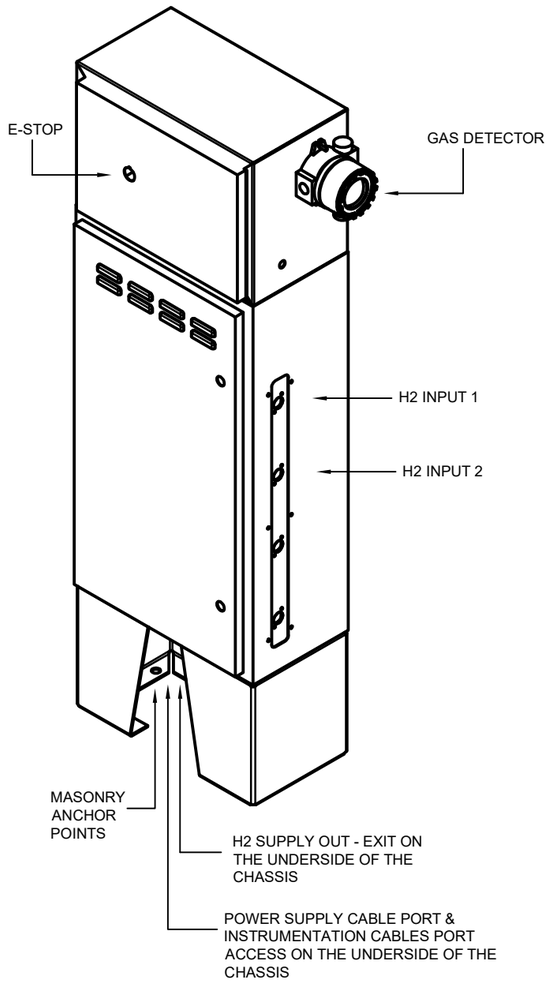


RevNo	Revision note	Date	Checked	Approved









ALL DIMENSIONS IN MM

Designed by:	Checked by:	Approved by:	File name	Date	Scale
CDE	OPS	P.D	HGM_GA_001	2/24/2020	1:1

ONEH2

GAS MODULE FULL ASSEMBLY

HGM_GA_001	Revision	Sheet
	A	3/3

Appendix D.

Communication Process Map

Process map

The objective of this document is to provide a streamline form of communication between Cruise Automation & OneH2 for the hydrogen refueling infrastructure installed at 241 & 246 Loomis St, San Francisco, CA 94107 for Cruise Automation.

The following two potential pathways explained when a problem is detected. If Operator detects an issue or if OneH2 Asset Management (AM) Team detects an issue.

If operator detects:

1) Operator will report any issue to Cruise Automation's POC
2) If problem persisted, Cruise Automation POC reaches out to OneH2 POC
3) OneH2 POC will report to Asset Management team who will determine the resolution
4) Problem will be solved by Asset Management team virtually or technician onsite

If OneH2 Asset management team detects

a) OneH2 AM team will determine the resolution
b) Problem will be solved by Asset Management team virtually or technician onsite

For item #3), follow the instructions to contact OneH2 POC

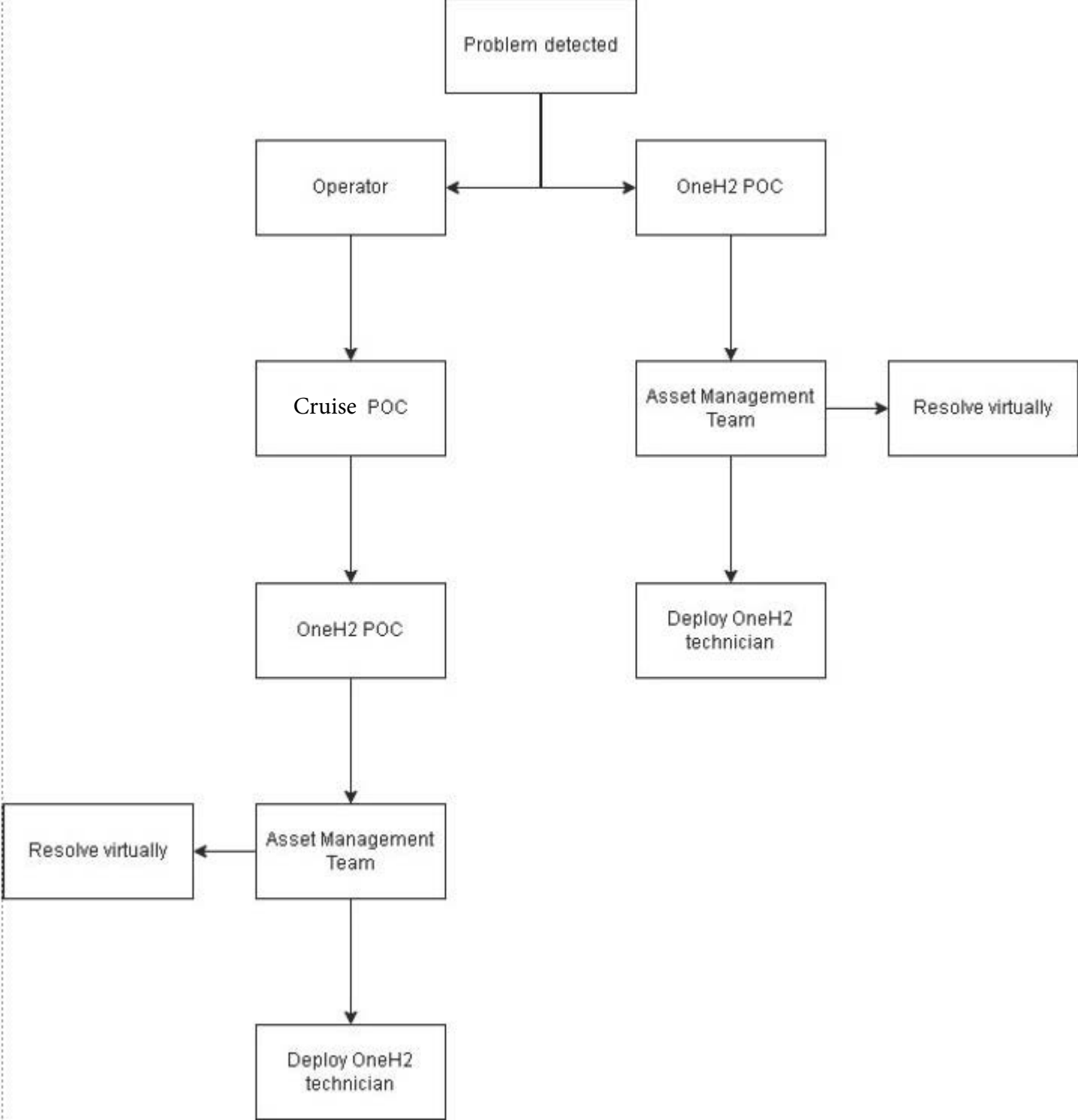
Step 1: Email OneH2 POC: Dan Poppe (OneH2 technician), Email: dan.poppe@oneh2.com
Step 2: Subject line

"Problem detected at Cruise Automation STX" Step 3: Body of the email

Problem – "Here clearly identify what you see with error codes, attach as many pictures and videos as possible. Also, identify which equipment you are seeing errors at. E.g. Gas Module towards the Entrance of the site"

Problem detected time – "When was the problem detected?"

Step 4: Send


Problem detected
Operator
OneH2 POC
Cruise POC
Asset Management Team
Resolve virtually
OneH2 POC
Deploy OneH2 technician
Resolve virtually
Asset Management Team
Deploy OneH2 technician

Contacts:

Operator: Numerous operators using FC equipment

Cruise Automation POC: Cruise Automation to add details

OneH2 Technician/ Primary POC: Dan Poppe, Email - dan.poppe@oneh2.com: (+1 (844) 996 6342, ext. 771)

OneH2 AM team - (+1 (844) 996 6342, ext. 0, or 828-999-2238 – asset.management@oneh2.com). 24/7 remote monitoring and support.

OneH2 - GM Service Operations: Emmanuel Ewaleifoh (+1 (844) 996 6342, ext. 733 – emmanuel.ewaleifoh@oneh2.com)

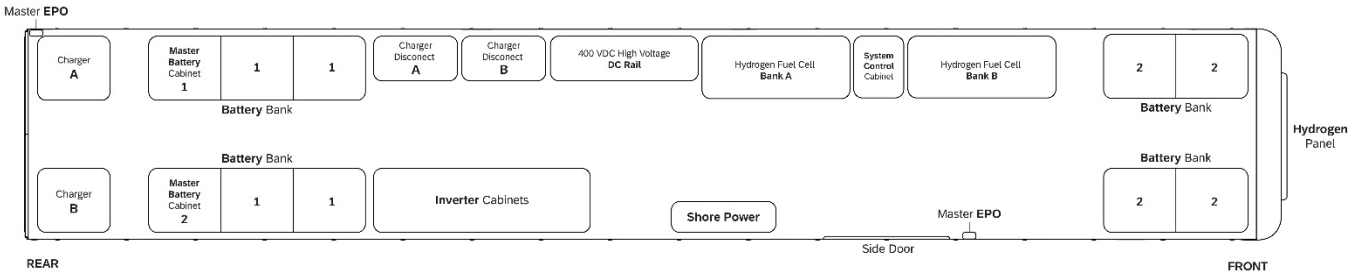
Appendix E.

MEC Trailer Quick Operation Guide

RENEWABLE INNOVATIONS

MEC-H2 QUICK GUIDE

MEC-H Component Layout



1. STARTING THE BATTERY SYSTEM:

1.1. Reset EPO buttons as required on both Master Battery Cabinets located at the rear of the trailer beside the EV Chargers. Reset is performed by pulling the EPO buttons.

1.2. Reset all string breakers in each of the 10 battery cabinets (2 per cabinet) by switching them to the “Off” (OPEN) position.

1.3. Press and hold the red button labeled “BLK Start” in Master Battery Cabinet 1.

1.3.1. While still holding the button, wait for the HMI display to show system min and max voltages, checking to ensure no errors or warnings are displayed.

1.3.2. Continuing to hold the button, turn “On” (CLOSE) one of the two string breakers in Master Battery Cabinet 1.

1.4. Releasing the button, check the HMI to ensure that “Working Number” shows “01”.

1.5. Proceed to turning “On” (CLOSING) the remaining 9 string breakers in Battery System 1.

1.5.1. Verify that all 10 strings are connected to the bus and working properly. The “Working Number” on screen should now read “10”.

1.6. Repeat steps 1.3 through 1.5.1 for Master Battery Cabinet 2.

1.7. Wait for the inverter system to fully activate and for the AC output to initialize. Inverters will be active when interior lights come on.

2. ACTIVATING THE HYDROGEN SYSTEM:

2.1. At the exterior hydrogen panel located at the front of the trailer, perform the following steps.

2.1.1. Close the “Inlet Valve” handle. (Vertical position.)

2.1.2. Close the “Outlet Valve” handle. (Vertical position.)

2.1.3. Close the “High-Pressure Vent Valve”. (Horizontal position.)

2.1.4. Close the “Low-Pressure Vent Valve”. (Horizontal position.)

2.2. After securely connecting the hydrogen source to the hydrogen panel, open the hydrogen source to supply hydrogen to the panel.
(**Note**: Hydrogen must be **at least 99.999% pure**. Hydrogen pressure cannot exceed 250 bar.)

2.3. At the hydrogen panel,

2.3.1. Open the “Inlet Valve”. (Horizontal position.)

2.3.2. Verify that “Outlet Pressure” gauge reads 8(±0.2) bar.

2.3.2.1. If the Outlet Pressure gauge does not read 8(±0.2) bar, adjust the regulator knob to bring the pressure into the correct range.

(**NOTE**: To adjust pressure downward, relieving pressure from the low side of the pressure regulator may be necessary. This is done by slowly and briefly slightly opening the low-pressure vent valve.)

2.3.3. Ensure that all eight black-handled manual hydrogen valves are open (horizontal). They are positioned at the front right-hand side of the fuel cell banks.

2.3.4. Open the Outlet Valve.

3. SWITCHING ON THE DC CHARGERS:

3.1. Switch “Charger A” disconnect (located on driver’s side of trailer interior) to the “On” position.

3.2. Switch “Charger B” disconnect to the “On” position.

3.3. Wait for the complete boot sequence to finish. The charger touchscreens will briefly (1-2 minutes) show an out of order error while initializing, after which they will display a charger selection screen.

3.3.1. Verify that there are no errors or warnings after initialization completes.

4. CONTROL CABINET

4.1. On the controls display, click/touch “Enable” button.

4.2. Verify that the system is in the “Standby” or “Running” state.

4.3. Charge electric vehicles by following the prompts on the charger display.

5. SHUTDOWN

5.1. Click “Disable”, located on the Control Cabinet display.

5.2. Wait for system to go into disabled state.

5.3. Push EPO buttons on the front of Mastery Battery Cabinets 1 and 2.

5.4. Close “inlet” and “outlet” valves located on external Hydrogen Panel.

6. EMERGENCY PROTOCOL

6.1. In the event of a suspected emergency or pre-emergency situation, press one of the Master EPO buttons located at the side or rear door(s) of the unit.

6.2. Notify Renewable Innovations of the event and any pertinent details for guidance on how to proceed.

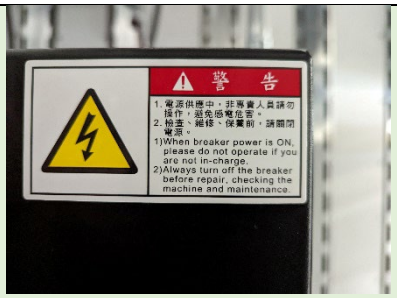
7. TROUBLESHOOTING

7.1. If normal operation is disrupted in a non-emergency manner, please contact Renewable Innovations through the dedicated support line for further instructions.

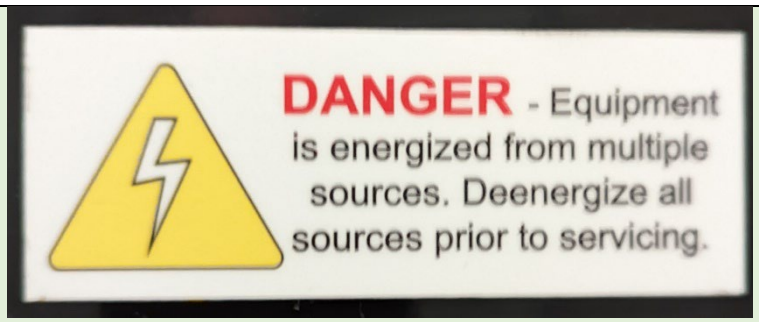
Appendix F.

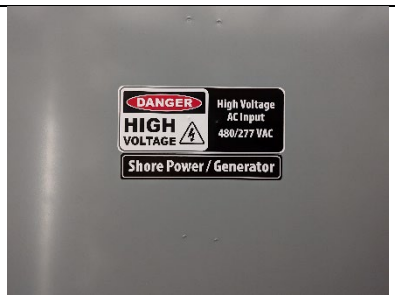
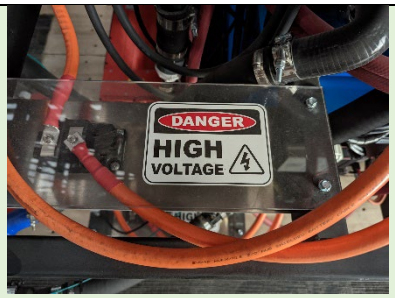
MEC Trailer Safety Labels

Safety Labels – MEC-H2

Photograph of Label	Location of Label
	Rear Doors, Passenger Side – Above Fire Extinguisher (1) Side Door – Above Fire Extinguisher (1)
	Master Battery Cabinets, Top Right-Hand of Doors (2)
	Slave Battery Cabinets, Top Right-Hand of Doors (8)

	Charger A Fused Disconnect (1) Charger B Fused Disconnect (1)
	Inside Door Panel of Charger A Fused Disconnect (1) Inside Door Panel of Charger B Fused Disconnect (1)
	Inside of Charger A Fused Disconnect (1) Inside of Charger B Fused Disconnect (1)
	Junction Box Above Charger A/B Fused Disconnects (1)

	DC Rail 1 and 2 (2)
	Balance of Plant Transformer (1)
	Balance of Plant Transformer (1)
	Inverter Doors, Top Right-Hand Side (5)
	Inverter Cabinets, Inside Front (5)

	Shore Power/Generator Junction Box (2)
	Fuel Cell Diode Covers (8)
	Fuel Cells (8)
	DC to DC Converters (4)
Danger! Hydrogen No Smoking or Open Flame! (Label pending)	Front and rear on both exterior sides of the unit. (4)

Appendix G

Site Photos

Photos looking East/Southeast

Photos looking Southwest/West

Photo looking North